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A battery of cognitive, personal, and demographic tests were given to 216 children from Title I (of the Elementary and Secondary Education Act) schools, with and without previous school experience, and to 31 children from non-Title I schools. The effects of prekindergarten experience upon subsequent school experience were evaluated. The Title-I sample included 122 prekindergartners, 52 kindergartners with previous school experience, and 42 kindergartners with no previous school experience. Prekindergartners improved on three subscales of the Illinois Test of Psycholinguistic Abilities (ITPA) and on color and shape naming. The group having prekindergarten experience surpassed the others only on the vocal encoding scale of ITPA. Title I children surpassed non-Title I children only on the verbal shape name inventory. Non-Title I children excelled in the auditory vocal association and the auditory vocal automatic subtests. No significant differences were found on teacher-rated pupil behavior. It was concluded that prekindergarten experience is related to verbal behavior. Additional research is suggested as necessary to evaluate readiness in disadvantaged children. (DO)

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Atlanta Public Schools

Atlanta, Georgia

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Funded Under ESEA Title I, P. L. 89-10

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I. INTRODUCTION

The pilot prekindergarten curriculum development project in the Atlanta Public Schools, which was initiated in the spring of 1966, is a part of the program funded under Title I of the Elementary and Secondary Education Act (ESEA), Public Law 89-10. During 1966-67 the prekindergarten project included eight groups of twenty four-year-old pupils from Title I schools, three groups of which were in the Educational Improvement Program (EIP). A team of three adults worked with each unit. Each team included a lead teacher, a teacher assistant, and a teacher aide. The program focused on providing a continuum of compensatory experiences for the children.

The preschool program also had a follow-up phase. Emphasis was placed on helping the kindergarten teachers to offer developmental opportunities to the pupils who had participated in the prekindergarten program the previous year. Five preschool specialists provided consultation and inservice training for the kindergarten teachers and the prekindergarten teaching teams.

The objectives of the program were based on the premise that early intervention in the childhood development of disadvantaged children would improve their skills in coping with educational experiences. These concepts of early childhood intervention, which had been developed from research, were reviewed in the Evaluation of the Preschool Program, 1966-67, published in the *Research and Development Report* of the Atlanta Public Schools, Volume I, Number 1, February, 1968. These objectives consist mainly of developing cognitive, social, motor, and personal skills as a preparation for the regular primary school experiences.

The current prekindergarten program is basically a continuation of the 1966-67 program. Likewise, this evaluation report is also a continuation. The

evaluation for the project includes measures of performance of the prekindergarten program during 1966-67 and of the sample groups of kindergarten pupils in Title I and non-Title I schools during the following year.

II. OBJECTIVES

The evaluation of the preschool program was based on the major objectives of the project. These objectives were (1) to provide compensatory experience for four-year-old children from families in low socio-economic school communities (Title I) which would prepare them to cope adequately with educational situations, (2) to develop further the *Prekindergarten Curriculum Objectives Outline*, and (3) to provide training and consultative assistance to the preschool teachers.

The overall instructional goals described in the *Prekindergarten Curriculum Objectives Outline* included the following:

A. To develop sensory perceptual skills in order to strengthen the functioning of the sensory and perceptual processes with which the child begins to construct and organize his knowledge and understanding of his environment.

B. To develop auditory perceptual skills in order to aid the functioning of the sensory and perceptual processes with which the child explores his environment.

C. To develop motor skills, coordination, awareness of how to use one's body, and fine motor skills for manipulating objects.

D. To develop social behavior through becoming aware of self as a person and to establish interdependent relationships with other children and adults.

E. To develop cognitive skills -- including thinking processes, concept formation, a meaningful use of numbers, and the use of language as a tool.

III. PURPOSES OF THE EVALUATION

On the basis of the objectives of the program and curriculum, a number of hypotheses were raised concerning probable group performances and teacher preferences.

Concerning the effects of prekindergarten experience, the following results were hypothesized:

A. If prekindergarten has an immediate effect, then (1) performance should be higher at the end of the actual prekindergarten year than at the beginning of the year on tasks involving auditory attention span, verbal reasoning, and language skills and (2) children with prekindergarten experience should do better at the beginning of the kindergarten year than children without such experience who come from similar communities and socio-economic backgrounds.

B. If prekindergarten has an effect upon subsequent school experience, then at the end of the kindergarten year children with prekindergarten experience should perform better on tasks involving auditory attention span, verbal reasoning, and language skills than their classmates without such experience.

C. By the end of the kindergarten year children with prekindergarten experience should be more nearly ready to read than children without such experience.

D. From the beginning to the end of the prekindergarten school year children should undergo changes in the amount and variety of foods eaten, in socially related eating habits, and in general health and appearance, resulting from their food service experience.

Concerning Title I experience but related to prekindergarten experience, the following hypothesis was formed:

E. If prekindergarten has the short term effect for disadvantaged populations of preparing them to cope with early primary educational experience, then by the end of the prekindergarten year it is hoped that children with such experience should be performing at about the level of non-Title I children. If diffusion of prekindergarten effects is positive, then it would be hoped that Title I kindergarten classes mixed with regard to prekindergarten experience would perform as well on the whole as non-Title I groups. To answer adequately questions concerning diffusion effects and to make valid non-Title I and Title I comparisons, it would be desirable to have intact classroom groups with and without prekindergarten experience as well as classroom groups mixed with regard to children having previous school experience. Still within the context of this particular design it may be possible to answer some questions about non-Title I versus Title I kindergarten differences.

Concerning teacher differences and relating both to prekindergarten experience and to the Title I variable, the following hypotheses were formed:

F. At the end of the year kindergarten teachers in non-Title I schools should rate personality and cognitive and social aspects of children's behavior differently with regard to the importance of these characteristics than would the Title I kindergarten teachers, and the latter would rate these characteristics differently than would the prekindergarten teachers.

G. There would be no differences between beginning and end-of-the-year teacher ratings concerning the importance which teachers place on pupil behavior among prekindergarten, Title I kindergarten, and non-Title I kindergarten teachers.

IV. REFERENCES TO TESTS

ITPA - *Illinois Test of Psycholinguistic Abilities* measures a child's language ability to respond to stimuli in a given way as indicated in the subtests.

AV As - *Auditory Vocal Association* is a subtest of the ITPA which measures the child's auditory attention span by testing his ability to relate spoken words in a meaningful way as indicated by an analogies test in which the child must complete short sentences by supplying some analogous word (for example, soup is hot; ice cream is cold). If a child is familiar with every word in a particular statement and has the correct response in his speaking vocabulary, he is not having trouble with decoding or encoding, but with association. The subtest is so constructed that for each level two words are from a vocabulary level two years below that age level.

AV Au - *Auditory Vocal Automatic* is a subtest of the ITPA which measures one type of the child's verbal reasoning by testing his responses to specific tasks which require functioning at an automatic or habitual level. The tasks call for verbal responses that are related to: (1) sequence (for example, here is an apple; here are two apples); (2) causality (for example, this man is opening a can; here is the can which was opened); (3) relationships (for example, this is a father; here is the father's son); and (4) tense (for example, mother is writing a letter; this is the letter she wrote).

VE - *Vocal Encoding* is a subtest of the ITPA which measures the child's language skill by testing his ability to express ideas in

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spoken words. In this test the child is asked to describe a simple object such as a block or a ball. His score depends on the number of unique and meaningful ways that he is able to characterize a given test object. The purpose is to present an object which is so familiar that the child cannot fail to recognize it; hence, if he fails to do the task, it is not a matter of failure to recognize the object but a failure to encode or to express adequately what he knows.

CNI - *Color Name Inventory* is an instrument, developed at the Institute for Developmental Studies in New York, which measures the child's environmental information as indicated in his ability to identify colors nonverbally (by pointing) and verbally (by saying the name of the color).

CNI-NV - *Color Name Inventory Nonverbal* measures ability of the child to discriminate among twelve different colors nonverbally.

CNI-V - *Color Name Inventory Verbal* measures ability of the child to identify up to twelve colors verbally.

SNI - *Shape Name Inventory* is an instrument, developed at the Institute of Developmental Studies in New York, which measures the child's environmental information as indicated in his ability to identify shapes nonverbally (by pointing) and verbally (by saying the name of the color).

SNI-NV - *Shape Name Inventory Nonverbal* measures ability of the child to discriminate among eight basic shapes nonverbally.

SNI-V - *Shape Name Inventory Verbal* measures ability of the child to identify up to eight basic shapes verbally.

PPVT - *Peabody Picture Vocabulary Test* measures the ability of a child to respond by pointing to the one of four pictures which best illustrates the stimulus word read by the examiner. The total score of correct responses (to 150 items) is converted to three types of derived scores: percentile rank, mental age, and standard score deviation, plus an I. Q. with a mean of 100 and a standard deviation of 15.

MRRT - *Metropolitan Reading Readiness Test* is used as a part of the pupil-personnel program within the Atlanta Public Schools to measure the child's readiness for the first grade. The test includes the following component parts: words, listening, matching, alphabet, numbers, and copying.

BRS - *Behavior Ranking Scale*, developed at the Institute of Developmental Studies in New York, measures the importance which teachers place on pupil behavior related to personality, cognitive skills, and social skills.

V. SOME CHARACTERISTICS OF THE PRESCHOOL GROUPS

The study involved 122 prekindergarten children who were enrolled during 1967-68 in 8 primary prekindergarten programs. The kindergarten sample consisted of 52 children who had attended a prekindergarten program the previous year, 1966-67, as well as 42 children having no previous school experience. All of these subjects were from Title I schools. In addition, 31 children from 3 non-Title I schools were used in the study.

Seventy-five teachers were involved in the programs from which the subjects were taken -- including 21

prekindergarten teachers, 25 Title I kindergarten teachers, and 29 non-Title I kindergarten teachers. These teachers participated in the collection of data and were also subjects in that they rated the children on some of the scales used and also completed the *Behavior Ranking Scale*, indicating the importance which they placed on various aspects of pupil behavior.

For the sake of clarity and identifying groups for comparison, children not from Title I schools will henceforth be referred to as non-Title I (non-T-I-K). Title I children who had prekindergarten experience will be referred to as follow through (FT) subjects, and Title I children with no prekindergarten will be referred to as kindergarten sample (K-S) subjects.

The follow through kindergarten group of pupils (FT) included all of the kindergarten pupils who had attended prekindergarten in the schools where there had been a prekindergarten program during 1966-67. An assumption was made that the follow through kindergarten pupils were representative of the 1966-67 prekindergarten pupils. This assumption was based on the normality of mobility in the Title I school communities. The kindergarten Title I sample of pupils (K-S) was randomly selected from those kindergarten classes in which the follow through pupils participated -- but did not include any of the follow through pupils. The non-Title I kindergarten pupils (non-T-I-K) were randomly selected from kindergarten classes in schools located in upper socio-economic communities. Generally, the kindergarten classes were held during a half day session either in the morning or in the afternoon. The size of the classes varied. One teacher was normally assigned to each class. However, in the Title I schools a teacher aide was available on a part-time basis to some of the kindergarten teachers.

The classroom management and instructional activities varied to some degree among the prekindergarten groups (PK). Schedules were adapted because of the need for transportation and/or chaperone arrangements

to enable the children to get to the centers and to return home, and schedules were also adjusted because of other school activities such as lunch and playground periods. Each group of prekindergarten children convened for approximately three hours daily.

The responsibilities of the members of the prekindergarten teaching teams varied because of the special skills of the team members and the special needs of the children. The lead teacher assumed responsibility for conducting regular planning sessions in order to develop daily instructional plans.

VI. PROCEDURES

In order to test the hypotheses, a battery of tests was administered to the children of each group. Data from these tests were used to measure the performance of pupils within the groups at the beginning and at the end of the year and to compare posttest scores among the groups.

Several procedures were used to obtain data on pupils. In some cases, classroom teachers administered individual tests to pupils in their classes. In other cases, tests were administered by preschool specialists or research personnel. Classroom teachers also gathered pupil personnel kinds of data on the children. Testing plans and schedules were coordinated through a Preschool Research Advisory Committee. The membership of this advisory committee included: the Assistant Superintendent for Research and Development of the Atlanta Public Schools, research personnel from the Educational Improvement Program, faculty members from Emory University who were directing research projects involving the groups of children included in this evaluation, and the research associate and instructional supervisor responsible for this report.

In order to measure the cognitive performance of the prekindergarten pupils, pretest and posttest data

were obtained by administering a series of tests, including three subtests of the *Illinois Test of Psycholinguistic Abilities* (ITPA): (1) *Auditory Vocal Association* (AV As), (2) *Auditory Vocal Automatic* (AV Au), and (3) *Vocal Encoding* (VE). Also administered were a *Color Name Inventory* (CNI) and a *Shape Name Inventory* (SNI). During the school year, the *Peabody Picture Vocabulary Test* (PPVT) was administered to all prekindergarten pupils. The *Metropolitan Reading Readiness Test* (MRRT) was also administered in April to all kindergarten pupils as a part of the city-wide testing program, yielding data which were used in the evaluation. Furthermore, in order to test the hypotheses concerning the teachers, the *Behavior Ranking Scale* was administered to the prekindergarten teachers, to a sample of kindergarten teachers in Title I schools, and to a sample of kindergarten teachers in non-Title I schools.

VII. ANALYSIS OF DATA

Due to the nature of the groups used in the study and to the nature of the questions posed in the hypotheses, it was decided that *t* tests of mean differences and analyses of variance where possible would yield the most clear cut and efficient ways of answering those questions.

For the sake of simplicity, the results will be presented in terms of what was found concerning prekindergarten effects, Title I conditions, and teacher variables. There will be some overlap in that what is reported under one heading might have direct implications for another area.

Part 1: Effects of Prekindergarten Experience Upon Cognitive Performance, Language Skills, and Reading Readiness.

Instruments involved in this section included the ITPA, the MMRT, and the color and shape naming inventories. In addition, social eating habits were looked at as a

check on the prekindergarten program food service objectives.

A. Immediate Effects of Prekindergarten Program

1. When the post-performance was compared with the pre-performance for the prekindergarten year, the post-performance was significantly higher on the three sub-scales of the ITPA and on both the verbal and non-verbal forms of the color and shape naming inventories. Significance on all of these variables reached the .01 level. These results may be seen in column 1 of Table 1 on page 24. Since there is the possibility that such gains could have been maturational, these findings can most meaningfully be viewed in conjunction with findings comparing the performance of beginning kindergarten pupils with and without the prekindergarten experience.

2. On the kindergarten pretest for the ITPA subscales and the color and shape naming inventories, the group having prekindergarten experience (FT group) scored higher on two sub-scales of the ITPA than did the group with no prekindergarten experience (K-S), but scored higher on neither the verbal nor nonverbal forms of the color and shape naming inventories. The FT group obtained a mean of 56.87 on the *Auditory Vocal Association* scale compared to the K-S group's mean of 51.50. This difference was significant at the .05 level. On the *Auditory Vocal Automatic* scale the FT and K-S groups had means of 56.67 and 46.66 respectively, a difference significant at the .01 level. These results are presented in Table 2 on page 25.

Considering the increase of scores on all seven of these sub-scales on the prekindergarten posttest and the finding of FT and K-S pretest differences on only two of the seven, it seems

likely that differences in vocal encoding and in naming and discriminating among basic colors and shapes were due primarily to maturational effects or at least to experiences which were not unique to the prekindergarten program. This appears to hold true at least for children with prekindergarten experience who have not actually had subsequent kindergarten experience.

B. Effects of Prekindergarten Upon Subsequent School Experience

The end of the year scores of the ITPA scales and the color and shape naming inventories showed that the FT group excelled the K-S group only on *Vocal Encoding*, the means on that scale being 73.44 and 65.76, a difference significant at the .01 level. *Vocal Encoding* is the only one of the three ITPA sub-scales that did not show a difference at the beginning of the year. This peculiar finding seems to indicate that prekindergarten experiences had an effect upon the ability to express ideas in spoken words and that this effect took place only after or perhaps during subsequent school experience. Since this ability to express oneself verbally has been so often noted as lacking among disadvantaged children and since so many succeeding educational experiences depend heavily upon verbal expression, this finding seems extremely important. These results are in Table 3 on page 26.

Diffusion is a factor which could not be controlled adequately in the study, but which should be examined more carefully in future research. In other words, the presence of children with prekindergarten experience in a classroom might have some effect upon the performance and acquisition of skills of their classmates not directly exposed to a full prekindergarten year. Such diffusion might be responsible for the finding of no differences at the end of the year. The K-S, or no-prekindergarten group, increased significantly from pretesting to posttesting on six of the seven variables used (see Table 1, Column 3). Two of these variables

were the two measured by the ITPA sub-scales on which the children had scored lower at the beginning of the year. The one in which there was no pretest-posttest significant difference for K-S was the *Vocal Encoding* scale, the scale noted above on which the two groups differed at the end of the year (Table 3, page 26).

The experienced group (FT) significantly improved on four of the seven variables from the beginning to the end of the year. The *Auditory Vocal Association* and *Vocal Encoding* scores improved by the end of the year, as well as the verbal forms of the color and shape naming inventories. These pretest to posttest differences were significant at the .01 level (see Table 1, Column 2).

C. Effects of Prekindergarten Experience Upon Readiness to Read

Scores on the *Metropolitan Reading Readiness Test* for kindergarten children with and without prekindergarten experience showed that those without such experience (K-S) scored significantly lower than the FT group on only one of the six sub-classifications. The alphabet section was the only one that discriminated between the two groups, showing means of 10.73 and 8.44 for the FT and K-S groups respectively. This difference was significant at the .05 level. The results discussed are presented in Table 4, on page 27.

D. Effects of Prekindergarten Experience Upon Eating Habits, Height, and Weight

The food service record reported the weight, height, and food habits of the prekindergarten children at the beginning and at the end of the school year. These data were used to test hypothesis E. The weight and height measures for the prekindergarten children are reported in Table 5 on page 28. An analysis of these pretest and posttest data showed that there was a significant difference (.01 level) in the weight and height of

the children. The children gained an average of 2.51 pounds in weight and gained an average of 2.14 inches in height during approximately eight months. The expected yearly gain of four-year-olds in height is between two and three inches and in weight is between four and five pounds.

In order to determine a change in the eating habits and in the general health appearance of the children during the year, *t* tests were computed on these pretests and posttest variables. The results are shown in Table 6 on page 29. Statistically significant differences at the .01 level were also shown in the amount and variety of foods eaten by the children for morning snack and lunch, with higher posttest mean scores. The eating habits as related to social behavior also showed a significant difference at the .01 level in three of the five measures taken, with higher posttest mean scores. Teachers rated the children higher, significant at the .01 level, on general health appearance at the end of the year than at the beginning.

Part 2: Performance of Title I Kindergarten Children Compared With Non-Title I Kindergarten Children.

The variables again included the ITPA, the MRRT, and the color and shape naming inventories.

E. Title I Versus Non-Title I Children

Non-Title I children significantly out performed Title I children on the *Auditory Vocal Association* scale and the *Auditory Vocal Automatic* scale. Title I children performed significantly better than non-Title I children on the discrimination form, the *Shape Name Inventory Nonverbal*. While these differences were significant at the .01 level, they should not be taken as a reflection of actual school experience in Title I schools. Since non-Title I children from this sample came from a definitely higher socio-economic level than Title I children, the obtained differences could easily have been related to that uncontrolled factor. These results are presented in Table 7 on page 30.

Part 3: Teacher Variables.

Training and consultative assistance to the preschool teachers were provided by the preschool specialists, the Coordinator of Elementary Education, and the Director of Inservice Education. Inservice sessions were held about twice a month. A major emphasis of the training was placed on methods of providing a continuing compensatory program for the children, based on the overall instructional goals. In addition to the inservice program, the preschool specialists provided consultation to the preschool teachers on an individual basis. The data concerning the effectiveness of the training and the assistance to the preschool teachers included measures of the teachers' ratings of child behavior. In order to test the hypotheses concerning the teachers' opinions of the importance they placed on child behavior as related to personality, cognitive skills, and social skills, a *Behavior Ranking Scale* was administered at the beginning and at the end of the year to: (1) a group of 21 prekindergarten teachers, (2) a group of 25 Title I kindergarten teachers, and (3) a group of 29 non-Title I kindergarten teachers.

F. End-of-the-Year Teacher Differences on the Behavior Ranking Scale

The *Behavior Ranking Scale* posttest scores for each of the three groups of teachers were treated by an analysis of covariance to test the teachers' rankings of child behavior. The *F* ratios showed no significant differences among the groups of teachers at the end of the year on their understanding of child behavior as related to personality, cognitive skills, and social skills.

G. Beginning to End-of-the-Year Teacher Changes on the Behavior Ranking Scale

In order to determine if there were changes during the year in the teachers' ranking of the importance of types of behavior and to determine the relative importance which they placed on

personality, cognitive skills, and social skills, t tests were computed on the combined means of the teachers' pretest and posttest scores for each *Behavior Ranking Scale*. The results of these data showed that the teachers scored significantly higher on personality (.05 level) on the pretest than on the posttest, indicating that the teachers placed more importance on the behavior of the pupils which was related to personality in the beginning of the year than they did at its end. However, because of the ranking nature of the scale, a rise in one sub-area must be accompanied by a corresponding decrease in one or both of the other areas. Since the teachers attached decreased importance to aspects of behavior related to the child's personality at the end of the year, it meant that they increased during the year their rankings on the cognitive and social aspects of the child's behavior. Since neither of the latter changes was significant, the increase in these rankings was neither especially for the cognitive nor for the social types of behavior, but with both increasing somewhat at the end of the year to compensate for the decreased emphasis on personality related behaviors. These results are presented in Table 8 on page 31.

In addition to the analyses described above, an intercorrelation matrix was prepared of the prekindergarten pretest and posttest scores on the three subtests of the *Illinois Test of Psycholinguistic Abilities (Auditory Vocal Association, Auditory Vocal Automatic, and Vocal Encoding)*; on the color and shape inventories *(Color Name Inventory Nonverbal, Color Name Inventory Verbal, Shape Name Inventory Verbal,* and *Shape Name Inventory Nonverbal)*; on the Peabody intelligence quotient and percentile scores; and on the pupil personnel data —including sex, age in months, number of siblings, order of siblings, persons with whom the child was living, and number of social agencies which had served the family. These data are shown in Table 9 on page 32. Generally, the cognitive scores were positively intercorrelated on both the pretest and posttest, 47 of the possible 57 coefficients being significantly

correlated. Also, the pretest cognitive scores were positively related to the posttest cognitive scores, 41 of the possible 48 coefficients being significantly correlated. The pupil personnel variables did not relate to the cognitive variables. However, there was positive correlation between the intelligence quotient scores and each of the seven cognitive variable post-test scores, as well as between the pretest scores on *Auditory Vocal Automatic* and *Shape Name Inventory Verbal*. These data showed that at the end of the year the cognitive scores were more closely related to the intelligence quotients than at the beginning of the year. This may indicate the children's lack of readiness to become involved in a testing procedure. Other significantly related variables which seemed to be meaningful indicated that: the younger the child, the more likely he was to live with his parents; the more children there were in the family, the more likely it was that a great number of social agencies had served the family; the more often that children lived away from both or one of their parents, the more often the family was served by a social agency; and the larger the number of children in the family, the lower the intelligence quotients of the children. To establish the meaning of the correlations related to pupil personnel, a longitudinal study should be made.

No detailed comparisons will be made in this report on the performances of the prekindergarten group of 1967-68 with the prekindergarten group of 1966-67 nor on the performances of the follow through group in 1967-68 with their performances as prekindergarten pupils in 1966-67. However, the mean posttest scores on five of the basic variables, shown in Table 10 on page 33, will give the reader some indication of the various relative levels of performance. These data showed that there was little difference in the performance of the prekindergarten groups in 1966-67 and in 1967-68 except in identifying colors nonverbally; and in this case, the 1967-68 group score (10.48) was almost five points higher than the 1966-67 group score (5.82). The follow through group scored about thirteen

points higher on the *Auditory Vocal Association* scale in the spring of 1968 (65.12) than in 1967 (52.35) and also made a gain of about five points in identifying colors nonverbally. However, they performed about the same both years on the verbal identification of colors and shapes and on the non-verbal identification of shapes.

The experiences of the prekindergarten teachers in using the *Prekindergarten Curriculum Objectives Outline* resulted in some suggested revisions. The preschool specialists and the Coordinator of Elementary Education revised portions of the curriculum guide. However, further revisions are indicated.

Two check lists, based on two of the curriculum objectives, were developed for the teachers to use to indicate their observations of pupil progress. These instruments are: *Check List I - Motor Skills* and *Check List II - Self Concept*.

VIII. SUMMARY

In order to evaluate the effects of prekindergarten experience upon subsequent school experience a battery of cognitive, personal, and demographic measures was given to children enrolled in prekindergarten programs, to kindergarten children with and without previous school experience, and to kindergarten children from non-Title I schools.

Prekindergarten pupils improved from the beginning to the end of the year on three subscales of the ITPA and on the color and shape naming inventories. That these gains might not have been due entirely to the effect of prekindergarten experience is evidenced by the finding that at the beginning of the kindergarten year children with prekindergarten experience out performed children without prekindergarten experience on only two of the seven basic variables, the *Auditory*

Vocal Association and *Auditory Vocal Automatic* scales of the ITPA.

By the end of the prekindergarten year the group having prekindergarten experience surpassed the non-experienced group only on the *Vocal Encoding* scale of the ITPA. Performance on this scale entails verbal expression, and this is apparently the only significantly affected skill of those tested which is involved in subsequent school experience.

Title I children, who were generally of a lower socio-economic level, out performed non-Title I children on only one basic variable, the verbal form of the *Shape Name Inventory*. The non-Title I children excelled in two subscales of the ITPA, the *Auditory Vocal Association* and the *Auditory Vocal Automatic*. These differences could have been due to socio-economic or related factors rather than to the effects of Title I school programs, since the former effects were not controlled.

Teacher rankings of importance which they placed on various aspects of pupil behavior showed no significant differences at the end of the year among Title I kindergarten, non-Title I kindergarten, and prekindergarten teachers. However, when these three groups were pooled, rankings of types of behaviors changed from the beginning to the end of the year. Personality was ranked as less important at the end of the year, whereas cognitive and social skills were ranked as more important at that time.

IX. CONCLUSIONS

The effect which prekindergarten experience had on the children appears to have been largely related to verbal behavior. The increased range of verbal vocabulary, the ability to recognize objects, and the ability to make associations were the most immediate results of the early extra year of school experience as evidenced

by superior performance of the follow through group on the auditory vocal association and automatic scales at the beginning of the kindergarten year. While gains during the kindergarten year were significant for children both with and without prekindergarten experience, the one area where the follow through group far out performed their less experienced classmates was in *Vocal Encoding* or verbal expression. It is possible that the prekindergarten experience was influential in preparing the children for additional classroom experience so that the latter experience became more meaningful to them and facilitated their ability to organize their perceptions and ideas.

The diffusion effects of initial or immediate gains made by prekindergarten children when they are placed with experienced classmates should be examined more thoroughly. It may be possible to discern whether the difference in ability to encode is related to some specific cognitive skill, such as memory, or whether it might be related to an affective or attitudinal component. Since verbal expression is so highly related to reading skills, writing skills, scholastic achievement, and interpersonal reactions, it would be wise to try to replicate this particular aspect of the findings and to devise ways to analyze the disadvantaged child and his more concretely manipulative skills or characteristics.

There has been difficulty in trying to find instruments that can adequately discriminate among disadvantaged children who will have greater or less success in scholastic achievement and in personal and social adjustment, and this difficulty highlights the importance of these particular findings concerning verbal expression. This difficulty also limits the conclusions that can be drawn about other possible significant differences between groups with or without prekindergarten and about diffusion effects or the subsequent "wash-out" of gains made earlier.

With regard to reading readiness, it shcould be noted that the MRRT tells very little about children from impoverished backgrounds. Almost invariably

scores on the sub-tests are extremely low, and variability among pupils is very small, making it difficult to use that instrument to break down any one child's skills in order to find a solution to his readiness problem. Perhaps, more specific tasks -- involving auditory discrimination, retention, word association, perceptual defense, closure, set, concept formation, or some as yet unquestioned functioning -- would be more successful than past efforts in identifying present weaknesses or in predicting future problems. In various parts of the country, including Atlanta, efforts are now being made to assess the significance of this type of approach.

The task at hand for all those concerned with the early education of disadvantaged children would appear to be to identify more definitely, to separate, and to study different instructional methods and activities. With these methods delineated, it will be easier to assess their effect upon various cognitive, social, and personal abilities. In nearly every preschool program now being developed there is either direct or an implicit attempt to improve language skills and the level of verbal responding. With increased precision in measuring various aspects of language skills and sub-skills it may be possible to shift curricula more toward developing the specific language-related skills and away from developing motor or perceptual skills. There is some evidence in this particular study that motor and some perceptual skills may develop without the aid of the actual prekindergarten program, perhaps due to maturation, perhaps because of home or other environmental influences outside the school. Assessing growth and performance on into the early elementary years, studying diffusion effects and varying instructional methods and objectives within prekindergarten and kindergarten programs are all crucial components of analyzing the effectiveness of programs now being developed.

X. RECOMMENDATIONS

Recommendations are based on implications from the findings of this study and on the experience with the prekindergarten program in relation to other early childhood education programs in the school system. The recommendations are as follows:

A. That possible diffusion effects be further studied by evaluating the cognitive, personal, and social development of kindergarten and first grade classrooms both intact and mixed with respect to prekindergarten experience.

B. That the format and procedures of the prekindergarten program be studied in order to determine a more effective manner to involve more children and more parents and, at the same time, to decrease the institutionalization of the program.

C. That the curriculum guide be further developed -- so that it will include a continuum for early childhood education through the primary grades and so that performance objectives, their sequence, appropriate media, and instructional strategies will clearly delineate the concepts, and their depths, to be experienced by the children at the various achievement levels.

D. That a systematic method for gathering information about parental involvement activities be developed, so that this part of the program may be evaluated.

E. That selected data gathered on the prekindergarten and follow through pupils be printed out by the computer to be used by the kindergarten and first grade teachers who will teach these children during 1968-69.

F. That consideration be given to establishing prekindergarten groups of three-year-olds in those school communities in which there is a parent-child center serving the "under-three-year-olds."

G. That a continued emphasis be placed on inservice education for the prekindergarten teachers, and especially for those teachers who will have prekindergarten follow through pupils in their classrooms.

H. That consideration be given to recruiting and training parents to serve as the third adult on staff teams, perhaps on a part-time or rotating basis, for prekindergarten units.

TABLE 1

Pretest and Posttest Basic Variables for Four Groups

Test Variable	GROUPS 1 PK N	Mean	t Ratio	2 FT N	Mean	t Ratio	3 K-S N	Mean	t Ratio	4 Non-T-1-K N	Mean	t Ratio
ITPA-AV As												
Pretest	86	40.91	11.32**	43	56.87	4.14**	29	51.50	4.06**	31	60.06	6.01**
Posttest		54.00			65.12			61.97			72.48	
ITPA-AV Au												
Pretest	76	44.63	3.31**	38	56.67	1.00	26	46.66	4.28**	31	70.73	0.40
Posttest		51.06			59.93			59.26			72.13	
ITPA-VE												
Pretest	87	43.58	9.11**	39	64.88	3.20**	27	60.08	1.78	27	70.63	0.30
Posttest		58.92			73.44			65.76			69.50	
CNI-Non-V												
Pretest	94	6.60	12.64**	20	10.08	1.95	20	9.96	3.70**	30	10.94	2.77**
Posttest		10.48			11.07			11.12			11.55	
CNI-V												
Pretest	88	4.75	13.41**	20	8.17	4.62**	20	8.12	5.36**	29	8.72	4.49**
Posttest		8.99			10.07			10.42			10.70	
SNI-Non-V												
Pretest	85	4.46	13.34**	19	7.32	(a)	18	6.56	3.66**	30	6.50	3.23**
Posttest		7.27			7.86			7.54			7.19	
SNI-V												
Pretest	80	2.41	20.13**	20	6.09	3.48**	18	5.40	3.42**	29	5.13	5.29**
Posttest		6.24			7.14			7.00			6.90	

** Significant at the .01 level.

(a) Incomplete data on one of the variables for this group.

TABLE 2

Pretest Basic Variables for the Follow Through and Kindergarten Sample Groups

Test Classification	Group	N	Mean	S.D.	*t* Ratio
ITPA - AV As	FT	52	56.87	12.89	2.06*
	K-S	42	51.50	11.99	
ITPA - AV Au	FT	49	56.67	18.28	2.91**
	K-S	41	46.66	13.99	
ITPA - VE	FT	48	64.88	15.01	1.42
	K-S	40	60.08	16.15	
CNI - Non-V	FT	24	10.08	2.60	0.17
	K-S	25	9.96	2.28	
CNI - V	FT	24	8.17	2.99	0.06
	K-S	25	8.12	2.88	
SNI - Non-V	FT	22	7.32	0.99	1.97
	K-S	25	6.56	1.56	
SNI - V	FT	23	6.09	1.78	1.26
	K-S	25	5.40	1.91	

* Significant at the .05 level.

** Significant at the .01 level.

TABLE 3

Posttest Basic Variables For The Follow Through and Kindergarten Sample Groups

Test Classification	Group	N	Mean	S.D.	t Ratio
ITPA - AV As	FT	43	65.12	13.22	0.83
	K-S	29	61.97	16.87	
ITPA - AV Au	FT	41	59.93	15.78	0.16
	K-S	27	59.26	16.88	
ITPA - VE	FT	43	73.44	14.33	2.51**
	K-S	29	65.76	11.23	
CNI - Non-V	FT	29	11.07	2.07	0.09
	K-S	26	11.12	1.90	
CNI - V	FT	29	10.07	2.43	0.64
	K-S	26	10.42	1.58	
SNI - Non-V	FT	29	7.86	0.44	1.67
	K-S	24	7.54	0.83	
SNI - V	FT	29	7.14	1.09	0.37
	K-S	24	7.00	1.47	

** Significant at the .01 level.

TABLE 4

The *Metropolitan Reading Readiness Test* Scores of the Follow Through and Kindergarten Sample Groups

Test Classification	Group	N	Mean	S.D.	t Ratio
Word	FT	46	8.56	3.50	1.88
Word	K-S	34	7.26	2.68	
Listening	FT	48	10.63	2.33	0.30
Listening	K-S	34	10.44	2.95	
Matching	FT	48	6.94	2.93	0.20
Matching	K-S	34	7.06	2.47	
Alphabet	FT	45	10.73	5.29	2.05*
Alphabet	K-S	34	8.44	4.49	
Numbers	FT	48	11.96	5.58	0.21
Numbers	K-S	34	11.71	5.05	
Copying	FT	40	7.05	4.11	1.10
Copying	K-S	31	6.10	3.07	
Total	FT	48	54.42	19.16	1.10
Total	K-S	34	50.32	14.04	
Percentile	FT	48	52.21	32.41	1.59
Percentile	K-S	34	42.35	23.13	

* Significant at the .05 level.

TABLE 5

Weight and Height for Prekindergarten Pupils

Variable	Time	N	Mean	S.D.	t Ratio
Weight (pounds)	Fall Spring	122	36.59 39.10	4.72 5.33	10.64*
Height (inches)	Fall Spring	121	40.30 42.44	1.68 2.54	13.05*

* Significant at the .05 level.

TABLE 6

Pretest and Posttest Variables for Prekindergarten Food Service

Variable	Test	N	Mean	S.D.	*t* Ratio
Eating Habits for Morning Snacks (Amount and Variety)	Pretest Posttest	127	3.01 3.34	.94 1.06	3.45*
Eating Habits for Lunch (Amount and Variety)	Pretest Posttest	122	2.86 3.11	.88 .68	2.53**
Eating Habits - Social Waits for all to begin eating	Pretest Posttest	108	2.68 3.10	.88 .68	4.05*
Uses silver properly	Pretest Posttest	122	2.81 3.03	.63 .78	2.54**
Eats slowly without dawdling	Pretest Posttest	119	2.72 2.91	.82 .84	1.94
Eats without dripping or spilling food	Pretest Posttest	123	2.82 2.99	.67 .76	2.14**
Eats without disturbing others	Pretest Posttest	123	2.92 3.01	.83 .81	1.06
Nutritional Appraisal (General Appearance)	Pretest Posttest	125	3.31 3.56	.84 .95	2.85*

* Significant at the .05 level.

** Significant at the .01 level.

TABLE 7

Posttest Basic Variables for Title I[(a)] and Non-Title I Groups

Test Variable	N	Mean	S.D.	*t* Ratio
ITPA-AV As				
Title I	72	63.85	14.78	-3.01**
Non-Title I	31	72.48	12.65	
ITPA-AV Au				
Title I	64	59.66	16.11	-3.04**
Non-Title I	31	72.13	19.92	
ITPA-VE				
Title I	66	70.30	13.60	0.21
Non-Title I	27	69.50	17.66	
CNI-Non-V				
Title I	40	11.10	1.97	-1.18
Non-Title I	30	11.55	1.21	
CNI-V				
Title I	40	10.25	2.03	0.92
Non-Title I	29	10.70	1.99	
SNI-Non-V				
Title I	37	7.70	0.70	2.26**
Non-Title I	30	7.19	1.08	
SNI-V				
Title I	38	6.52	1.27	-1.20
Non-Title I	29	6.90	1.30	

[(a)] Title I group composed of follow through and kindergarten sample groups.

** Significant at the .01 level.

TABLE 8

Pretest and Posttest Scores of Teachers
on the *Behavior Ranking Scale*

Variable	N	Mean	S.D.	r	*t* Ratio
Personality					
Pretest	53	16.51	3.98	.19	2.16*
Posttest	53	16.35	4.19		
Social					
Pretest	53	12.31	3.76	.15	.54
Posttest	53	11.98	3.56		
Cognitive					
Pretest	53	13.09	5.22	.30	.49
Posttest	53	12.72	5.12		

* Significant at the .05 level.

Table 9

INTERCORRELATION MATRIX OF THE PREKINDERGARTEN I.Q., TEST SCORES, AND PUPIL PERSONNEL DATA

VARIABLE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	
1 Sex	1.00**	0.07	-0.03	0.07	0.13	0.18	-0.02	-0.14	0.06	0.04	0.06	0.08	0.09	0.16	0.01	0.01	0.06	0.07	-0.01	0.03	-0.14	-0.15	1
2 Pre-AV As	—	1.00**	0.22*	0.45**	0.31**	0.26*	0.30**	0.35**	0.57**	0.46**	0.31**	0.33**	0.30**	0.22*	0.36**	0.04	-0.02	0.09	-0.13	-0.17	0.60**	0.52**	2
3 Pre-AV Au	—	—	1.00**	0.31**	0.26*	0.28*	0.17	0.21	0.18	0.27*	-0.17	0.09	0.16	0.16	0.26*	0.12	0.00	0.04	0.02	-0.14	0.14	0.26*	3
4 Pre-VE	—	—	—	1.00**	0.30**	0.27*	0.18	0.29**	0.30**	0.35**	0.20	0.14	0.14	0.06	0.12	0.10	-0.07	0.02	-0.06	0.03	0.17	0.23**	4
5 Pre-CNI-Non-V	—	—	—	—	1.00**	0.78**	0.39**	0.44**	0.43**	0.38**	0.30**	0.49**	0.56**	0.24*	0.43**	0.19	0.01	0.13	0.05	0.14	0.13	0.07	5
6 Pre-CNI-V	—	—	—	—	—	1.00**	0.32**	0.48**	0.42**	0.42**	0.25	0.44**	0.53**	0.41**	0.53**	0.24*	-0.04	0.02	0.05	-0.07	0.07	0.13	6
7 Pre-SNI-Non-V	—	—	—	—	—	—	1.00**	0.51**	0.24*	0.06	0.18	0.22*	0.22*	0.16	0.30**	0.14	-0.00	-0.02	-0.05	-0.06	0.12	0.17	7
8 Pre-SNI-V	—	—	—	—	—	—	—	1.00**	0.54**	0.33**	0.26*	0.27*	0.37**	0.27*	0.52**	0.18**	-0.04**	0.08	-0.06	-0.03	0.45**	0.47**	8
9 Post-AV As	—	—	—	—	—	—	—	—	1.00**	0.63**	0.40**	0.35**	0.34**	0.35**	0.51**	0.13	-0.10	-0.02	-0.05	-0.11	0.24*	0.38**	9
10 Post-AV Au	—	—	—	—	—	—	—	—	—	1.00**	0.38**	0.30**	0.36**	0.22*	0.32**	0.09	-0.13	-0.10	0.02	-0.16	0.36**	0.50**	10
11 Post-VE	—	—	—	—	—	—	—	—	—	—	1.00**	0.37**	0.37**	0.26**	0.25**	0.02	-0.09	-0.06	0.02	-0.18	0.32**	0.42**	11
12 Post-CNI-Non-V	—	—	—	—	—	—	—	—	—	—	—	1.00**	0.70**	0.47**	0.44**	0.11	-0.08	-0.01	-0.08	-0.00	0.27**	0.26**	12
13 Post-CNI-V	—	—	—	—	—	—	—	—	—	—	—	—	1.00**	0.58**	0.56**	0.07	-0.19*	-0.08	-0.12	-0.06	0.31**	0.38**	13
14 Post-SNI-Non-V	—	—	—	—	—	—	—	—	—	—	—	—	—	1.00**	0.73**	0.16	-0.01	0.05	-0.02	0.11	0.23*	0.27**	14
15 Post-SNI-V	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.00**	0.09	-0.06	-0.05	0.09	0.16	0.25*	0.24*	15
16 Age in Mos.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.00**	0.10	0.20**	-0.20*	0.05	-0.14	-0.07	16
17 No. of Sib.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.00**	0.90**	-0.09	0.31*	-0.20*	-0.25*	17
18 Order of Sib.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.00**	-0.17	0.16	-0.17	-0.17	18
19 Living With	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.00**	0.31**	0.12	0.04	19
20 No. Soc. Ag.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.00**	-0.11	-0.12	20
21 Peabody I. Q.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.00**	0.80**	21
22 Peabody Perc.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.00**	22

* Significant at .05 level.

** Significant at .01 level.

TABLE 10

Posttest Mean Scores on Five Basic Variables for the Prekindergarten (1966-67 and 1967-68) and for the Follow Through (1967-68) Groups

Test Variable	Prekindergarten		Follow Through
	1966-67	1967-68	1967-68
ITPA-AV As	52.35	54.00	65.12
CNI-Non-V	5.82	10.48	11.07
CNI-V	10.72	8.99	10.07
SNI-Non-V	7.50	7.27	7.86
SNI-V	7.04	6.24	7.14